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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,389	10/17/2001	David Graumann	PW 027 6903 P12451	6813

8791 7590 02/16/2006

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EXAMINER

FAULK, DEVONA E

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/981,389

Applicant(s)

GRAUMANN, DAVID

Examiner

Devona E. Faulk

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 12/7/2005 have been fully considered but they are not persuasive. Regarding prior art Birchfield, the applicant asserts that paragraph 0038 does not mention reflecting acoustic waves in any context and that there is no discussion of at least one reflector having an acoustically reflective surface structured and arranged to reflect the acoustic wave in a direction of the first location and the second location. The examiner disagrees. As the examiner indicated in the office action, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having an irregular shape. The applicant discloses in his specification, on page 7, that a suitable reflector may be shaped like the outer ear of human beings. The examiner asserts that the human ear is inherently reflective. Birchfield teaches of a first and second microphone and the human ear implicitly reflect in both directions. The examiner is maintaining her rejection regarding the Birchfield reference.

2. The indicated allowability of claims 6,11,18-26 are withdrawn in view of the newly discovered reference(s) to Nordstrom et al. Claims 6,8,11,19-26 were indicated as allowable but after further searching in a another class, the examiner has found prior art to read on "associating or creating a set of phase signature tables associating phase angles, between when the acoustic waves reach the first microphone and when the

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acoustic waves reach the second microphone, with detected frequencies at a predetermined location". Rejections based on the newly cited reference(s) follow.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1-5,7-10,12-17** are rejected under 35 U.S.C. 102(e) as being anticipated by Birchfield et al. (U.S. Patent Application 2002/0097885).

Regarding **claim 1**, Birchfield discloses an acoustic source localization system and method comprising:

a first microphone (302A; Figure 3) located at a first location to detect acoustic waves at the first location;

a second microphone (302B; Figure 3) located at a second location to detect the acoustic waves at the second location; at least one acoustically reflective surface to reflect the acoustic waves in a direction of the first location and the second location (paragraph 0038; Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker ; A human has ears, and the ears read on

at least one acoustically reflective surface having an irregular shape; the ear implicitly reflects in both directions);

an acoustic analysis device to detect and analyze acoustic waves (330.  
paragraph 0039; Figure 3);

a processing device to determine a spatial location of a source of the acoustic waves (340; paragraph 0042).

Regarding **claim 2**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having an irregular shape. Therefore, all elements of claim 2 are comprehended by claim 1.

Regarding **claim 3**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface shaped like a human pinna. Therefore, all elements of claim 3 are comprehended by claim 1.

Regarding **claim 4**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having low acoustic absorption properties. Therefore, all elements of claim 4 are comprehended by claim 1.

Regarding **claim 5**, Birchfield discloses a processing device that directs an observation device in a direction of the spatial location of the source of the acoustic waves (paragraph 0072).

Regarding **claim 7**, Birchfield discloses an acoustic source localization system and method comprising:

using a first microphone (302A; Figure 3) to detect acoustic waves at the first location;

using a second microphone (302B; Figure 3) to detect the acoustic waves at the second location;

using at least one acoustically reflective surface to reflect the acoustic waves in a direction of the first location and the second location (paragraph 0038; Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker ; A human has ears, and the ears read on at least one acoustically reflective surface having an irregular shape; the ear implicitly reflects in both directions );

analyzing the acoustic waves (330. paragraph 0039; Figure 3);

determining a spatial location of a source of the acoustic waves (340; paragraph 0042). The method is inherent in the functionality of the system.

Regarding **claim 8**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having an irregular shape. Therefore, all elements of claim 2 are comprehended by claim 7.

Regarding **claim 9**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having low acoustic absorption properties. Therefore, all elements of claim 4 are comprehended by claim 7.

Regarding **claim 10**, Birchfield discloses directing an observation device in a direction of the determine spatial location of the source of the acoustic waves (paragraph 0072).

Regarding **claim 12**, Birchfield discloses an acoustic source localization system and method comprising a computer-readable medium (RAM; paragraph 0037);

a computer-readable program code, stored on the computer-readable medium (paragraph 0037); having instructions to use a first microphone (302A; Figure 3) to detect acoustic waves at the first location; to use a second microphone (302B; Figure 3) to detect the acoustic waves at the second location;

reflect the acoustic waves in a direction of the first microphone and second microphone (paragraph 0038); analyze the acoustic waves (330. paragraph 0039; Figure 3); determining a spatial location of a source of the acoustic waves (340; paragraph 0042).

Regarding **claim 13**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on wherein at least one acoustically reflective surface is utilized to reflect the acoustic waves. Therefore, all elements of claim 13 are comprehended by claim 12.

Regarding **claim 14**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read wherein on at least one acoustically reflective surface having an irregular shape. Therefore, all elements of claim 2 are comprehended by claim 13.

Regarding **claim 15**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on wherein at least one acoustically reflective surface has low acoustic absorption properties. Therefore, all elements of claim 4 are comprehended by claim 13.

Regarding **claim 16**, Birchfield discloses wherein the computer-readable program code includes instructions to direct an observation device in a direction of the determine spatial location of the source of the acoustic waves (paragraph 0037; paragraph 0072).

Regarding **claim 17** Birchfield discloses the computer-readable program code includes instructions to set a first delay to delay an output of the first microphone and a second delay to delay an output of the second microphone, based upon the spatial location of the source of the acoustic waves (paragraph 0039).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 6,11,18-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Birchfield et al. (U.S. Patent Application 2002/0097885) in view of Nordstrom et al. (US 5,058,419).



Regarding **Claim 6,11 and 18** Birchfield fails to disclose but Nordstrom teaches of further including a calibration device to create a set of phase signature tables associating phase angles, between when the acoustic waves reach the first microphone and when the acoustic waves reach the second microphone, with detected frequencies at a predetermine spatial location (Figure 5; column 3, lines 16-32). Birchfield discloses computing phase angles corresponding to microphone position (paragraph 0058). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Birchfield by creating a phase table as claimed in order to calculate the location of the sound source using the most frequently occurring data (Nordstrom, column 2, lines 38-40).

7. Regarding **claim 19**, Birchfield discloses a method of creating a phase signature table comprising:

emitting acoustic waves of known frequencies from predetermine spatial locations (Figure 3; paragraph 0042);

using a first microphone (302A; Figure 3) to detect acoustic waves at the first location; using a second microphone (302B; Figure 3) to detect the acoustic waves at the second location;

determining a phase angle between when the acoustic waves reach the first location and when the acoustic waves reach the second location, for each of known frequencies (paragraph 58); associating the phase angles with the known frequencies at each of the predetermine spatial locations (paragraph 0042; paragraph 0058) .

Birchfield fails to disclose but Nordstrom teaches of creating a phase signature table wherein the variation between associated phase angles and predetermined phase angles for known frequencies is indicative of a predetermined spatial location (Figure 5; column 3, lines 16-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Birchfield by creating a phase table as claimed in order to calculate the location of the sound source using the most frequently occurring data (Nordstrom, column 2, lines 38-40).

Regarding **claims 20-22**, Birchfield as modified by Nordstrom discloses including reflecting the acoustic waves in a direction of each of the first location and the second location; wherein at least one irregularly shaped surface is utilized to reflect the acoustic waves; and wherein at least one irregularly shaped surface is shaped like a human pinna. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on further including reflecting the acoustic waves in each direction of each of the first location and the second location.

8. Regarding **claim 23**, Birchfield discloses an acoustic source localization system and method comprising:

- a computer-readable medium (RAM; paragraph 0037);
- emitting acoustic waves of known frequencies from predetermined spatial locations (Figure 3; paragraph 0042);
- using a first microphone (302A; Figure 3) to detect acoustic waves at the first location;

using a second microphone (302B; Figure 3) to detect the acoustic waves at the second location; determining a phase angle between when the acoustic waves reach the first location and when the acoustic waves reach the second location, for each of known (paragraph 58);

associating the phase angles with the known frequencies at each of the predetermine spatial locations (paragraph 0042; paragraph 0058) . Although he teaches on the above named elements, Birchfield fails to disclose creating a phase signature table with the data.

Birchfield fails to disclose but Nordstrom teaches of creating a phase signature table wherein the variation between associated phase angles and predetermined phase angles for know frequencies is indicative of a predetermined spatial location (Figure 5; column 3, lines 16-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Birchfield by creating a phase table as claimed in order to calculate the location of the sound source using the most frequently occurring data (Nordstrom, column 2, lines 38-40).

9. Regarding **claims 24-26**, Birchfield as modified by Nordstrom discloses wherein the computer-readable program code includes instructions to reflect the acoustic waves in a direction of each of the first location and the second location; wherein at least one irregularly shaped surface is utilized to reflect the acoustic waves; and wherein at least one irregularly shaped surface is shaped like a human pinnea. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on the claim language.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DEF

  
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PRIMARY EXAMINER